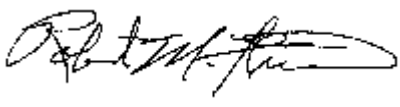


ISSUE DATE: 06/27/05

PROGRAM INFORMATION BULLETIN NO. P05-11

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SUBJECT: Mining Controls, Inc. (MCI) Fluorescent Luminaires, MSHA Certification  
X/P-3843-2

**Who needs this information?**

Mine Safety and Health Administration (MSHA) personnel, underground coal mine operators, underground metal and nonmetal operators, miner's representatives, and repair shop facilities should have this information.

**Why is MSHA issuing this Bulletin?**

This Program Information Bulletin (PIB) informs mine operators that polycarbonate clear plastic globe lenses used in explosion proof luminaires have experienced deterioration in the trona mines of Green River, Wyoming. This deterioration may impact the permissibility status of the lens assembly. It is suspected that the deterioration resulted from exposure to trona, but MSHA requests all mine operators that use polycarbonate clear plastic globe lenses to examine the lenses and report failures to the contact persons below.

**What permissible fluorescent luminary assembly does this PIB address?**

This PIB addresses a permissible luminaire, MSHA Certification No. X/P-3843-2, containing a Lexan 143 polycarbonate plastic lens manufactured by GE plastics.

**Why does this globe lens require an examination?**

The globe lens is part of the permissible luminaire that covers the fluorescent light source. Any cracking, crazing, and/or deformity of the globe lens will make the lighting fixture non-permissible and require that the globe be replaced. Cracks will extend from the inner to outer surface and will be typically found at sharp corners or radiating from a spot that was impacted or struck. A craze is typically a network of fine cracks along the outer surface and often shows up as a hazy or frosted area on the lens. Cracks, crazes, or other defects may be more easily seen if the lens is examined with the fluorescent bulb turned off. If any of these conditions are found, the lens must be replaced.

**Which permissible fluorescent luminaire assemblies should be examined?**

The fluorescent luminaires with MSHA Certification No. X/P-3843-2 manufactured by MCI should be examined. The Lexan globes can be found in underground coal and metal and nonmetal mines throughout the country.

**How can the fluorescent luminaires be maintained in permissible condition?**

The globe lens needs to be replaced if any cracking, crazing, and/or deterioration is observed.

**What is the background for this bulletin?**

An MSHA inspector found a MCI machine light clear plastic globe lens with a hole in it on a roof bolting machine. The inspector indicated that similar failures were found at other trona mines in the area. He requested assistance from Technical Support to determine whether this problem was a product defect in the globe or related to the environment in the mine. The mines involved are the trona mines around Green River, Wyoming. A damaged globe was obtained for inspection. It was observed that the deterioration was from the outside in and the globe material appeared to have melted, cracked, and broken, thereby forming a hole.

The investigation to date indicates that the properties of the trona ore, along with water, cause a chemical reaction with the material of the globe. Trona is an alkali mineral and according to GE plastics, Lexan polycarbonate in contact with an alkali may result in premature failure or severe degradation.

**Are there other environmental sources that can affect polycarbonate plastics?**

Other chemicals found in the mining environment may also cause premature failure of the Lexan material and all other polycarbonate plastics. Chemicals that may result in premature failure are as follows:

- a. Petrol, hydraulic fluid (oil, grease, lubricants)
- b. Synthetic hydraulic fluid (alcohol based)
- c. Cleaning solvents (brake cleaners, electrical contact cleaners)
- d. Oil based paints

Heat and ultra-violet light also have a detrimental effect on polycarbonate plastics. Plastic manufacturers and MSHA have determined that the maximum service temperature of a polycarbonate globe lens is 240 degrees. Care should be taken to keep enclosures away from areas that radiate excessive heat and do not mount light fixtures that can come in contact with hot surfaces. Explosion-proof enclosures including light assemblies should not be kept in direct sunlight or exposed unprotected to mercury vapor lights for an extended period of time. Ultra-violet light will change the chemical composition of the polycarbonate and render the enclosure in non-permissible condition.

#### **Where else can polycarbonate plastics be found?**

Polycarbonate plastics can also be found on other types of equipment and explosion-proof enclosures:

- a. other light fixtures
- b. view windows on explosion-proof enclosures
- c. meter enclosure lens

#### **What is MSHA's authority for this PIB?**

The Federal Mine Safety and Health Act of 1977; 30 CFR §§75.503 and 57.22305.

#### **Internet Availability**

This information bulletin may be viewed on the Internet by accessing MSHA's home page at <http://www.MSHA.gov> and then choosing Compliance Info and Program Information Bulletins.

#### **Who are the MSHA contact persons for this bulletin?**

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